

Patent
Attorney Docket: 53951-074

CLAIM AMENDMENTS

Please amend the claims as follows.

1-141. (Canceled)

142. (Original) A fluid balancing system comprising: a chamber having a volume; an inflow channel that communicates with the chamber; an outflow channel that communicates with the chamber; a pump on at least one of the inflow channel or the outflow channel that delivers a pump volume per turn and that operates at a speed; and a valve that operates to close and open the outflow channel and that cycles between closed and open positions at a rate, wherein the pump speed and rate of valve operation is synchronized so that the number of pump turns per valve operation is approximately equal to the volume of the chamber divided by the pump volume per turn.

143. (Original) The fluid balancing system of claim 142, wherein the valve comprises a pinch clamp.

144. (Original) The fluid balancing system of claim 142, further comprising a valve that operates to close and open the outflow channel.

145. (Original) The fluid balancing system of claim 142, wherein the number of pump turns per valve operation is approximately 5:1.

146. (Original) The fluid balancing system of claim 142, wherein the volume of the chamber divided by the pump volume per turn is approximately 5.

147. (Original) The fluid balancing system of claim 142, wherein the pump bears against a length of tubing that communicates with at least one of the inflow channel or the outflow channel.

148. (Original) The fluid balancing system of claim 142, wherein the pump is a roller pump.

Patent
Attorney Docket: 53951-074

149-155. (Canceled)

156. (New) A fluid balancing system comprising: first and second chambers alternately fed by an incoming fluid that is consumed by a process and an outgoing fluid that is discarded from said process;

said first and second chambers being configured to displace fluid mutually such that as one is filled, fluid is forced out of the other and vice versa;

an incoming fluid supply mechanism that conveys incoming fluid into said first chamber during a first cycle such that said first chamber is entirely filled with said incoming fluid, thereby displacing said outgoing fluid from said second chamber;

an outgoing fluid supply mechanism that conveys outgoing fluid into said second chamber during a second cycle such that said second chamber is only partly filled with said outgoing fluid, thereby displacing an equal volume of said incoming fluid from said first chamber.

157. (New) A system as in claim 156, wherein said incoming fluid supply mechanism includes a pump mechanism and a fluid bypass configured to allow said incoming fluid to recirculate once a respective one of said first and second chambers is filled, said first cycle being such that said incoming fluid is supplied at such a volume that it completely fills said respective one of said first and second chambers causing it to recirculate, whereby a complete filling of said respective one of said first and second chambers is ensured.

158. (New) A system as in claim 156, wherein said outgoing fluid supply includes a positive displacement pump that is controlled such that it displaces, during each of said first and second cycles, no more fluid than required to partially fill a respective one of said first and second chambers.

Patent
Attorney Docket: 53951-074

159. (New) A system as in claim 158, wherein said first and second cycles correspond to respective inlet and outlet valve configurations which control said incoming and outgoing fluid supply mechanisms and said positive displacement pump is mechanically synchronized with a mechanical mechanism that controls said valve configuration.

160. (New) A system as in claim 159, wherein said incoming fluid supply mechanism includes a pump mechanism and a fluid bypass configured to allow said incoming fluid to recirculate once a respective one of said first and second chambers is filled, said first cycle being such that said incoming fluid is supplied at such a volume that it completely fills said respective one of said first and second chambers causing it to recirculate, whereby a complete filling of said respective one of said first and second chambers is ensured.

161. (New) A system as in claim 156, wherein said first and second cycles correspond to respective inlet and outlet valve configurations which control said incoming and outgoing fluid supply mechanisms and said positive displacement pump is mechanically synchronized with a mechanical mechanism that controls said valve configuration.